

Mineral Industry Surveys

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TIN IN MAY 1999

Domestic consumption of primary tin in May was estimated by the U.S. Geological Survey to be about 2% lower than that in April and 7% higher than that in May 1998.

The *Platt's Metals Week* average composite price for tin in May was \$3.72 per pound, up by 2% from April and down 5% from May 1998. May was the fourth consecutive month in 1999 to record a price increase.

In Pittsburgh, PA, researchers at the University of Pittsburgh's School of Engineering developed a lead-free alternative to steel grade 12L14, a commonly used free-machining steel. Tin is used as the replacement for lead. The development may not only eliminate an environmental hazard, but may also offer cost savings. The research was largely supported by an international consortium of steel producers and users. The university created the international consortium to commercialize the technology and has also signed a technology licensing agreement with the consortium. The consortium is a limited liability company (LLC) known as the Nonleaded Free Machining Steel Consortium LLC. The producer members of the LLC will produce the lead-free steel commercially and sublicense it to others. Members include the University of Pittsburgh; United Alloys and Steel Corp.; MacSteel, a division of Quanex Corp.; Curtis Screw Co.; Saarlsteel AG; and Laurel Steel, a division of Harris Steel Ltd. USS/Kobe Steel Co., which has the option of joining the consortium by July 31, has also provided financial support. The new steel, termed "green" steel, resulted from research by Anthony J. DeArdo and C. Isaac Garcia, professors of materials science and engineering at the University. Tin was used as a replacement for lead, which has traditionally been added to steel to make it easier to machine. The researchers studied leaded steel using an atom-probe field ion microscope to examine the ferrite grain boundaries in order to determine what the lead did on an atomic level that made the steel more machinable. After selecting tin as the most suitable replacement, the researchers experimented with different ratios of tin in steel before coming up with the new steel. They found that too much tin made the

steel brittle; too little tin made it harder to machine. The final selected tin content reportedly not only makes the steel more machinable but also could permit a substantial reduction in the machining cost of the final components. A test of the final product, completed recently at USS/Kobe Steel Co., found that a 200-ton heat of the new steel performed well. The most common use for the steel is in automobile parts, and there are indications that major automakers in Germany and the United States will be willing to use lead-free steel if it is competitively available (*Journal of Metals*, 1999).

In China, it was announced that the country's tin production in 1998 totaled 78,840 tons, up 29% from that of 1997. Tin output in 1997 was 61,000 tons. The rise was attributed partly to increased demand from China's producers of tin-plated sheet. The State Nonferrous Metals Industry Administration indicated China exported 45,000 tons of refined tin in 1998, up 50% from 30,000 tons in 1997. These figures also give an indication of China's primary tin consumption (*Platt's Metals Week*, 1999a).

In England, reports indicated that the pumps had been turned off at the last operating tin mine in Cornwall. The South Crofty tin mine was flooding at the rate of 1.5 million gallons of water per day in May as the most recent sale agreement, intended to lead to a return of the mine to production, was declared void by the property owner. The owner, South Crofty plc, had been paid only 10% of the approximately \$900,000 purchase price for the operation. Despite repeated time extensions, the intended buyer was either unable or unwilling to pay the balance of the purchase price. On April 16 the intended buyer was asked to remove its equipment from the site (*Platt's Metals Week*, 1999b).

In London, England, it was announced that four metal industry executives from England and Russia have combined to form a new company to source raw materials, provide financing, and market metals for Russia's Novosibirsk Tin Works. The new organization, Russian Tin Sales Ltd., has been incorporated in England, with an office in London. The smelter was described as one of the largest in the world with a rated capacity of more than

10,000 tons per year (American Metal Market, 1999b).

In China, the Ministry of Land and Natural Resources announced that it had issued a notice banning new mining projects between April 23, 1999, and December 31, 2000, for eight minerals to ease “overproduction and reckless exports.” The eight minerals are: antimony, barite, coal, fluorite, molybdenum, rare earths, tin, and tungsten (American Metal Market, 1999a).

Industry observers noted that China’s demand for tinplate is forecast to grow strongly in the near term, but the country is expected to remain heavily dependent on imports in spite of increasing domestic production capacity. Impressive growth in the food and beverage can sector pushed Chinese tinplate demand up to 760,000 tons in 1998. By 2000, this figure is expected to rise to almost 1 million tons. Currently, China has eleven tinplate producers. In addition, the tinplate production lines at Shenyang Zhongyi tinplate Co., are due to start up in July 1999. This will bring China’s total production capacity to 1.5 million tons annually. However, domestic output was only 550,000 tons in 1998. This was largely because Chinese-produced tinplate is often of lower quality than imported material in terms of flatness, uniformity of tin coating, and surface finish. Also, many Chinese tinplating lines rely on imported blackplate as a feedstock. Only the Baoshan and Wuhan steelworks are capable of producing blackplate that matches the quality of imports (Metal Bulletin, 1999a).

Pakistan opened its first domestic source of tinplate in June, when the Siddiqsons Group started commercial production on a 120,000-ton-per-year line at Winder in Baluchistan. The new line was equipped by Itam, and both Sollac (France) and Mitsubishi (Japan) are shareholders in the facility. Siddiqsons officials said

the target is to produce at about 70% of capacity in the first year of operation. Sollac is contracted to supply 50% of the blackplate feedstock in the first year, and Mitsubishi 25%. The project’s total cost is \$30 million, of which 40% is equity financed. Sollac and Mitsubishi hold 7% each and Siddiqsons 45%; another 25% has been privately placed. Siddiqsons aims to sell the remaining 16% of the equity through a flotation this Summer. It is planned to sell the facility’s output mainly to the clarified butter industry, which constitutes about 70% of tinplate demand in Pakistan (Metal Bulletin, 1999b).

Update

On July 2, 1999, the *Platt’s Metals Week* composite price for tin was \$3.58 per pound.

References Cited

- American Metal Market, 1999a, China halts new mining permit for 8 minerals: American Metal Market, v. 107, no. 105, May 28, p. 5.
- 1999b, Execs form company to handle Russian tin: American Metal Market, v. 107, no. 115, June 16, p. 2.
- Journal of Metals, 1999, University of Pittsburgh produces lead-free steel: Journal of Metals, v. 51, no. 7, July, p. 6-7.
- Metal Bulletin, 1999a, Chinese tinplate demand forecast to grow: Metal Bulletin, no. 8389, July 1, p. 16.
- 1999b, Pakistan starts up first tinning line: Metal Bulletin, no. 8387, June 24, p. 19.
- Platt’s Metals Week, 1999a, Chinese production up 28%: Platt’s Metals Week, v. 70, no. 22, May 31, p. 4.
- 1999b, South Crofty allowed to flood: Platt’s Metals Week, v. 70, no. 20, p. 12.

TABLE 1
SALIENT TIN STATISTICS 1/

(Metric tons, unless otherwise noted)

	1998 p/	1999		
		April	May	January-May
Production, secondary e/ 2/	10,800	900	900	4,500
Consumption:				
Primary	41,400	3,740	3,680	18,500
Secondary	11,400	1,050 r/	1,080	5,190
Imports for consumption, metal	44,000	3,690	NA	NA
Exports, metal	5,020	507	NA	NA
Stocks at end of period	XX	7,760 r/	7,510	XX
Prices (average cents per pound): 3/				
Metals Week composite 4/	373.26	365.05	371.94	XX
Metals Week New York dealer	261.38	254.38	264.81	XX
London, standard grade, cash	251.00	244.00	256.00	XX
Kuala Lumpur	246.06	238.86	251.52	XX

e/ Estimated. p/Preliminary. r/ Revised. NA Not available. XX Not applicable.

1/ Data are rounded to three significant digits, except prices.

2/ Includes tin recovered from alloys and tinplate. The detinning of tinplate (coated steel) yields only a small part of the total.

3/ From Platt's Metals Week.

4/ The Metals Week composite price is a calculated formula, not a market price, that includes fixed and finance charges, and a risk factor. It normally is substantially higher than other tin prices.

TABLE 2
METALS WEEK COMPOSITE PRICE 1/

(Cents per pound)

Period	High	Low	Average
1998:			
May	398.53	384.51	392.33
June	413.70	382.49	397.36
July	381.20	374.98	377.55
August	386.88	374.45	380.30
September	373.12	364.56	368.24
October	374.40	356.46	366.88
November	380.73	361.99	370.09
December	363.97	350.47	357.58
January-December	413.70	350.47	373.26
1999:			
January	353.37	343.72	348.59
February	364.44	351.24	356.56
March	363.63	356.99	361.19
April	377.31	357.08	365.05
May	384.76	373.61 2/	371.94

1/ The Metals Week composite price is a calculated formula, not a market price, that includes fixed and finance charges, and a risk factor. It normally is substantially higher than other tin prices.

2/ Adjusted by the U.S. Geological Survey.

Source: Platt's Metals Week.

TABLE 3
TINPLATE PRODUCTION AND SHIPMENTS IN THE UNITED STATES 1/

(Metric tons, unless otherwise noted)

Period	Tinplate waste (waste, strips, cobble, etc.) (gross weight)	Tinplate (all forms)		Tin per metric ton of plate (kilograms)	Shipments 2/
		Gross weight	Tin content		
1998 p/	W	1,700,000	8,760	5.2	2,320,000
1999:					
January	W	127,000	723	5.7	185,000
February	W	135,000	713	5.3	177,000
March	W	143,000	768	5.4	218,000
April	W	144,000	781	5.4	195,000
May	W	148,000	807	5.5	NA

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data.

1/ Data are rounded to three significant digits.

2/ Shipments data from American Iron and Steel Institute monthly publication.

TABLE 4
U.S. TIN IMPORTS FOR CONSUMPTION AND EXPORTS 1/

(Metric tons)

Country or product	1999			
	1998	March	April	January- April
Imports:				
Metal (unwrought tin):				
Belgium	324	7	6	18
Bolivia	5,160	63	502	1,070
Brazil	4,710	260	100	1,020
Chile	894	545	--	1,290
China	9,870	511	1,600	4,070
Hong Kong	840	--	54	95
India	359	--	--	--
Indonesia	7,880	640	660	2,680
Japan	222	80	43	123
Malaysia	1,870	175	59	623
Peru	8,650	1,200	620	3,040
Singapore	822	--	--	60
Thailand	540	--	20	20
United Arab Emirates	100	--	--	--
United Kingdom	790	1	--	2
Vietnam	212	--	--	--
Other	220	70	20	127
Total	44,000	3,550	3,690	14,200
Other (gross weight):				
Alloys	1,320	122	206	793
Bars and rods	1,160	105	83	332
Foil, tubes, and pipes	3	--	(2/)	(2/)
Plates, sheets, and strip	93	1	15	18
Waste and scrap	4,190	283	230	1,250
Miscellaneous	1,800	130	113	469
Total	8,560	641	648	2,860
Exports (metal)	5,020	508	507	2,070

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5
CONSUMPTION OF TIN IN THE UNITED STATES, BY FINISHED PRODUCT 1/

(Metric tons of contained tin)

Product	1998 p/	1999						January- May total
		April			May			
		Primary	Secondary	Total	Primary	Secondary	Total	
Alloys (miscellaneous) 2/	368	W	W	W	W	W	W	W
Babbitt	35	W	W	W	W	W	W	22
Bar tin and anodes	20	22	--	22	21	--	21	97
Bronze and brass	1,010	118	140	258	102	149	251	1,330
Chemicals	8,020	663	W	663	663	W	663	3,320
Collapsible tubes and foil	177	W	W	W	W	W	W	W
Solder	12,500	982 r/	310 r/	1,290 r/	779	337	1,120	5,100
Tinning	764	22 r/	--	22 r/	20	--	20	218
Tinplate 3/	8,800	781	--	781	807	--	807	3,790
Tin powder	W	W	--	W	W	--	W	W
White metal 4/	W	W	--	W	W	--	W	W
Other	4,310	256	101 r/	358 r/	391	94	485	2,800
Total reported	36,000	2,840	551 r/	3,400	2,780	580	3,360	16,700
Estimated undistributed consumption 5/	16,800	900	500	1,400	900	500	1,400	7,000
Grand total	52,800	3,740	1,050 r/	4,800	3,680	1,080	4,760	23,700

p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includesterne metal.

3/ Includes secondary pig tin and tin acquired in chemicals.

4/ Includes pewter, britannia metal, and jewelers' metal.

5/ Estimated consumption of plants reporting on an annual basis.

TABLE 6
DEFENSE LOGISTICS AGENCY
TIN STOCKPILE DISPOSALS 1/

(Metric tons)

Period	Monthly disposals 2/
1998:	
May	220
June	220
July	250
August	250
September	220
October	190
November	--
December	20
January-December	1,900
1999:	
January	20
February	--
March	5
April	30
May	--
Total	55

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ These disposals represent only the daily spot sales program, not the long-term dealer contract sales program.

Source: Defense Logistics Agency.